

DIRECTORS MEETING MINUTES PUBLISHED

Full Accounts of the February Meeting of Directors

Meeting of
The Board of Directors
February 15, 1931
Cleveland, Ohio

Present:
W. B. Coleman
B. F. Shepherd
A. H. d'Arcambal
R. G. Guthrie
A. Oram Fulton
F. B. Drake
J. M. Watson
W. H. Eisenman

Absent:
O. E. Harder
Upon motion made, seconded, and unanimously carried the minutes of the previous meeting were approved as read.

Upon motion made, seconded, and unanimously carried the following resolution was adopted:

"In order to comply with the laws of the state of Ohio, under which the American Society for Steel Treating is incorporated and in which the directors elect their own officers, therefore, be it resolved that the following are to constitute the officers of the American Society for Steel Treating for the year 1931:

President — J. M. Watson
Vice-President — A. H. d'Arcambal
Treasurer — A. Oram Fulton
Secretary — W. H. Eisenman

Appointments on national committees previously submitted by President Watson to the board and approved by them were, upon motion properly made, seconded, and unanimously carried, confirmed as published in the January issue of *Metal Progress*.

A report relative to the Western Metal Congress and Exposition was presented. This report showed that there were 10 sessions of the congress representing a total of 30 papers and that 13 national societies cooperated in the program.

The A. S. S. T. secured 16 of the 30 papers and these papers were assigned to the technical program of other societies.

A further report was made relative to the publication policy of the papers presented at the Western Metal Congress to the effect that the Society securing the papers has a right to their publication irrespective of the program upon which they are presented.

Present business conditions had a very pointed effect upon the exposition. However, 162 firms were represented in the show.

The income from the exposition was equal to the expense, and it was felt that a service had been done for the industries of the West.

A report was presented showing the status of the technical program for the 1931 congress to be held in Boston.

(Continued on Page Two)

A.S.T.M. PRINTS ALLOY DATA

Tables Concerning Corrosion and Heat Resisting Alloys Sell for \$1.50

Eleven data tables on corrosion and heat resisting alloys have been prepared by Committee A-10 of the American Society for Testing Materials. The tables appear in Part I of that Society's current *Proceedings* but are also available in special reprint form for \$1.50.

A note to the A. S. T. M. office, 1315 Spruce St., Philadelphia, will bring a prospectus describing fully these tables of valuable information. A check for \$1.50 will bring the tables themselves. The tables are conveniently bound.

WELD MEETING AT LEHIGH U.

March 27 is Date Named for Symposium Sponsored Every Year by University

Lehigh University's annual welding symposium will be held in Bethlehem, Pa., on March 27, an occasion in past years for the gathering of hundreds of engineers from the industrial centers of the East and Midwest.

Features of the meeting will include demonstrations of the different welding methods and an exhibition of the use of gamma rays in weld testing. J. C. Hodge, Babcock and Wilcox Co., will be one of the principal speakers. His paper will outline some of his recent improvements in welding.



William P. Woodside, Detroit, founder member of A.S.S.T. and Hants E. Brown, blacksmith for over 63 years. Mr. Brown forged chain links on the floor during the recent Western Exposition and attracted big crowds.

A Message from the Board

IMPORTANT COMMUNICATION FROM
THE BOARD OF DIRECTORS

Please read this communication. It contains information you should and must know.

Your board of directors recognizes the fact that it was elected by the 6,000 members to represent them and to conduct the Society all the time for the best interests of the membership.

Your board of directors serves without salary, feels its responsibility keenly, and gives of its time and best thought to the conduct of the affairs of the Society. Every policy is accepted only after very careful and thorough deliberation.

The board knows that the majority of the membership understands and appreciates that the members obtain many times the value of the \$10.00 membership dues.

The membership also recognizes that the services rendered have been increasing steadily since the inception of the Society and that at the present time each member has expended upon him many times the amount of his annual dues.

The Society's activities such as your publications, conventions and expositions have produced revenue in excess of the amount expended and they must continue to produce revenue in excess of the expenditure. This is an evident and well known fact. If it were not true, the only other alternative would be a very material increase in your dues.

Here are the facts:

The National Society retains only \$6.50 from any membership, either sustaining or individual. The balance of the dues is returned to the local chapters for the support of their activities.

In other words, out of \$70,000.00 collected from dues from all classes of membership, \$30,000.00 is returned to the chapters, leaving but \$40,000.00 for the National Society. This is approximately one-ninth of the total expense for a year's activities. The income to meet this deficit is dependent upon the Society's other activities.

From the above you can easily see that your Society does a business of \$360,000.00 a year with only \$40,000.00 net income for dues from its entire membership.

The present activities of your Society cannot be maintained on the revenue received from dues. The Society does not have an endowment. It does have, however, a relatively small additional income of approximately \$8,500.00 a year obtained from interest on a surplus invested in savings accounts and high grade bonds, representing an income of \$1.30 per member. This surplus represents the only tangible background of protection which the Society has to assure its present and future activities.

There is one other fact that is equally important: the additional revenues should be earned through activities possessing the greatest safety and permanence. From a careful study over a period of years and a great deal of experience and data, we, the board of directors, do not consider expositions as the safest and most permanent type of activity. The board does feel that your publications offer this security and permanence which is essential to the future success and activities of the organization.

The publication of the bound volume of *TRANSACTIONS* just off the press resulted in a loss to the Society of approximately \$5,000.00 in spite of the fact that over 1400 members ordered the volume at \$2.50.

It will be more expensive to forward in monthly installments to the membership the contents of the annual volume containing the technical papers. Nevertheless your board of directors has decided that beginning with next November the bound volume of *TRANSACTIONS* will be discontinued. The members will receive in its place free of charge the contents of the bound volume in 12 monthly installments. The first number of *TRANSACTIONS* will contain technical papers from the Boston convention complete with discussion.

Preprints of convention papers will be distributed on request as in the past. *TRANSACTIONS* will be 6 by 9 inches over all.

The board of directors has become convinced through commendations that the publication of *METAL PROGRESS* has fulfilled a decided need on the part of the large majority of the members. The board will continue to lend its entire support and hearty cooperation to maintain *METAL PROGRESS* in its present position of high favor and general esteem.

Revenue expended for the benefit of the members in excess of the small amount received from dues must be earned. In order to earn that revenue the activities which are capable of producing revenue, such as the convention and more particularly *METAL PROGRESS*, should have and must have the entire support and cooperation of the entire membership.

Your board of directors sincerely requests that they receive this united spirit of cooperation in behalf of the Society's undertakings.

(Signed:)

OFFICERS AND DIRECTORS

AMERICAN SOCIETY FOR STEEL TREATING

J. M. WATSON, President
A. H. d'ARCAMBAL, Vice-President
A. ORAM FULTON, Treasurer
W. H. EISENMAN, Secretary
W. B. COLEMAN, Director
O. E. HARDER, Director
F. B. DRAKE, Director
B. F. SHEPHERD, Director
R. G. GUTHRIE, Director

Office of the Society, 7016 Euclid Avenue, Cleveland, Ohio, February 13, 1931

50,000 STAMPEDE TO WESTERN METAL SHOW; SESSIONS ATTENDANCE AVERAGES OVER 250

Exhibitors and Exposition Visitors Alike Acclaim the Success of Second Western Congress and Show

More than 50,000 persons attended the Western Metal Congress, held Feb. 16 to 20, in the Civic Auditorium, San Francisco. This figure was declared an indication of an outstanding success. That the event was a real service to the industrial needs of the community was the statement of hundreds of industrial plant operators throughout the 11 western states. Exhibitors were reported well satisfied, both with the attendance at the Western Metal and Machinery Exposition, one of the features of the congress, and with the sales they made during the show to West Coast business men.

Attendance not only was drawn from all parts of this country but from many foreign nations. Within half an hour, one booth registered the names of six foreign visitors, some of them hailing from distances as remote as the Philippine Islands. Naturally, the 11 western states were the best represented.

A spirit of optimism for business conditions prevailed as sale after sale was recorded by the exhibitors. Many of them sold thousands of dollars worth of machinery and equipment before the show had been running two days.

The Western Metal Congress now is firmly established in the West. Two years ago in Los Angeles the event was introduced in Southern California. Now it is firmly set in the northern end of the state.

The congress will be held either in Oakland, San Francisco, or some near point in 1935. Plans already are well underway for the Los Angeles meeting in 1933.

In the exhibit hall of the show just closed, virtually every device for fabricating, treating and finishing metals was displayed. The auditorium, with its blazing furnaces and sizzling welders, filled the dome of the building with haze, producing the effect of a monster machine shop.

WESTERN METAL PAPERS

Information as to where printed copies of papers presented at the Western Metal Congress may be obtained appears on Page Two.

Speakers on the different congress programs represented the leading metallurgical concerns of this country, and radiated ideas that will go far in putting the fabrication of metals upon a higher plane of efficiency.

Sessions, exhibits and other participation were supplied the congress by the following twelve technical engineering societies, working in co-operation with and under the auspices of the A. S. S. T.:

American Chemical Society, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Welding Society, Institute of Metals, National Purchasing Agents Association, Pacific Coast Electrical Association, Pacific Coast Gas Association, Society of Automotive Engineers, American Society for Testing Materials and National Association of Power Engineers.

WEAVER BROTHERS CO. GROWS

Merges With Bowie Co. and Moves Plant to 9205 Inman Ave., Cleveland

Weaver Brothers Co., Adrian, Mich., manufacturers of supplies and equipment for pickling rooms and acid baths, have recently merged with the H. J. Bowie Co. of Cleveland. The combined office and plant will be located at 9205 Inman Ave., Cleveland. The pickling room supplies will continue to be sold under the name of Weaver Brothers Co.

Weaver Brothers have for years made a line of acid treating tanks, receiving baskets and chemicals. The Bowie Co. is equipped to manufacture all manner of structural steel shapes, tanks, boilers and the like. The combination of facilities, covering both heavy and light metal structural work, makes possible the construction of any type or size of acid treating and acid resisting equipment.

An enlarged plant and very central location insure prompt and efficient service to all parts of the country.

500 EXPECTED FOR N. E. JOINT MEETING

Committee from New England Chapters Approves Plans

Completed plans for the New England Spring Sectional Meeting at Hartford on April 14 assure the 500 or more members and guests who are expected a full day of most interesting instruction and entertainment. All of the national officers have indicated their intentions to be present if possible, and members from many different Chapters will attend.

Representatives of the Boston, Rhode Island, Worcester, Springfield and New Haven chapters have met with the executive committee of the Hartford chapter and approved the plans which had been made by the special committee headed by D. A. Nemser.

The program for the day follows:

9:00 A.M. Registration at Hotel Bond.
10:00 A.M. Technical Session, "The X-Ray in the Metal Industry" by E. W. Page, General Electric X-Ray Corp.
11:15 A.M. Technical Session, "Recent Developments in Nitriding" by Dr. Victor O. Homberg, Massachusetts Institute of Technology.
1:30 P.M. Inspection Trip, Pratt & Whitney Co.
3:00 P.M. Inspection Trip, Pratt & Whitney Aircraft Co.
4:00 P.M. Inspection Trip, Chance Vought Corp.
6:30 P.M. Dinner, "The Metallurgist in Industry" by Dr. Zay Jeffries.

At the two technical sessions extremely interesting information will be presented, covering the latest applications of the X-Ray for non-destructive inspection of metal parts and also the latest improvements in the nitriding process.

Fred G. Hughes, vice-president of New Departure Co., and a past national president of the Society, will serve as technical chairman of the morning sessions, which will be held in the Ball Room of the Hotel Bond.

The plant visitations were covered in detail in the last issue of the *REVIEW*. It is only necessary to add that A. H. d'Arcambal, in arranging the visits, not only has been able to have the two modern aircraft plants opened for inspection, but also has succeeded in arranging that everything of interest will be shown to small parties led by competent guides.

As a suitable climax, Dr. Zay Jeffries will speak after dinner on the subject "The Metallurgist in Industry." Dr. Jeffries is well known to all of the members of the Society and his ability as a speaker is acclaimed. Frank P. Gilligan, past national president of the Society, will serve as toastmaster.

SO. OHIO MEN MEET MAR. 10

Members from Cincinnati, Dayton Join in Columbus for Full Day Program

The third annual joint meeting of the southern Ohio chapters of the A. S. S. T., Cincinnati, Dayton and Columbus, takes place March 10 with the Columbus chapter as host. A good attendance from these chapters is expected and many other guests will attend.

A luncheon served at noon will be followed by visits to a number of Columbus plants. Following a dinner in the evening, Professor Bradley Stoughton of Lehigh University and Dr. V. N. Krivobok of Carnegie Institute of Technology will present papers. The Fort Hayes Hotel is headquarters.

THE REVIEW

Devoted to the interests of the American Society for Steel Treating

A Review of the Activities of the Chapters and National Organization of the A. S. S. T.

Published monthly by the
AMERICAN SOCIETY for STEEL TREATING
7016 Euclid Ave., Cleveland, O.J. M. WATSON, President
A. ORAM FULTON, Treasurer
R. G. GUTHRIE, Director
R. F. SHEPHERD, DirectorA. H. D'ARCAMBAL, Vice-President
W. H. EISENMAN, Secretary
F. B. DRAKE, Director
O. E. HARDER, Director

W. B. COLEMAN, Director

Subscription \$6.00 a year; 5 cents a copy.

RAY T. BAYLESS Editor
JOHN G. MAPES Managing Editor

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WESTERN METAL CONGRESS PAPERS

There were 30 papers presented at the Western Metal Congress, Feb. 16-20, 1931. These papers were secured by the various societies cooperating on the technical program.

According to agreement, the society securing a paper had the privilege of prior publication. The list appended below shows the distribution of the papers by societies.

Correspondence with reference to these papers should be addressed to the respective society as indicated:

AMERICAN SOCIETY FOR STEEL TREATING, 7016 Euclid Ave., Cleveland.

The Formation and Elimination of Nonmetallic Inclusions in the Acid Open-Hearth Furnace by C. H. Herty, Jr. and J. E. Jacobs—published *Metal Progress* and preprinted.

High Test Cast Iron by F. B. Coyle—published *Transactions*.

Automotive Steels by J. M. Watson—published *Metal Progress*, Feb., 1931.

Steel Personality by B. F. Shepherd—published *Metal Progress*, Feb., 1931.

Recent Developments in Welded-On Overlays by Miles C. Smith—published *Transactions*.

Structural Arc Welding by A. F. Davis—published *Metal Progress*, Feb., 1931.

Carburizing Steel by Gas by R. G. Guthrie—to be published *Metal Progress*.

Correlation of the Crystal Structures and Hardness of Nitrided Cases by O. E. Harder and George B. Todd—to be published *Transactions*, Nov., 1931.

Machinability of Metals by A. H. d'Arcambal—Not to be published.

Chromium and Chromium Nickel Steels by C. C. Snyder—published *Metal Progress*, Feb., 1931.

Recent Developments in Corrosion Prevention of Ferrous Metals by V. V. Kendall and F. N. Speller—published *Metal Progress*, Feb., 1931.

Manufacture of Seamless Steel Tubing and Some of Its Properties by H. E. Passmore.

Seamless Rolled Steel Cylinders as Applied to Pressure Vessels and Penstock Construction by H. L. R. Whitney.

Gas Furnace for Nitriding by James H. Knapp—published *Metal Progress*, Feb., 1931.

SOCIETY OF AUTOMOTIVE ENGINEERS, 29 West 39th St., New York City.

Automobile Steels by A. B. Domonoske.

Aluminum Alloys by W. M. Holzhauser.

Magnesium Alloys by Dr. J. A. Gann.

AMERICAN SOCIETY FOR TESTING MATERIALS, 1315 Spruce St., Philadelphia, Pa.

Failure of Machine Parts by L. T. Holt.

Metallurgy of Welding by Paul Jeffers.

High Strength Steels for a High Pressure Hydraulic Jack by George H. Bragg.

AMERICAN WELDING SOCIETY, 33 West 39th St., New York City.

Welding Aluminum and Its Alloys by W. H. Dunlap.

A General Specification for Welded Pressure Vessels by J. C. Hodge.

Shape Cut Steel by C. E. Rhein.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 29 West 39th St., New York City.

Improvements in the Physical Properties of Large Carbon and Alloy Steel Castings by J. Fenstermacher.

Creep of Metals at Elevated Temperatures by P. G. McVetty.

PACIFIC COAST GAS ASSOCIATION, 447 Sutter St., San Francisco, Calif.

Progress and Development of Fuel-Fired Furnaces by E. G. de Coriolis.

AMERICAN CHEMICAL SOCIETY, Washington, D. C.

Combating the Corrosion Problem with Lubricated Valves by George F. Scherer.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, 29 West 39th St., New York City.

Electricity in the Steel Mill by G. E. Stoltz.

Use of Electricity in the Heat Treatment of Steels by G. W. Bernhard.

INSTITUTE OF METALS, 29 West 39th St., New York City.

Useful Properties of Manganese Steels by D. H. Young.

BUDGET FOR THE YEAR 1931

INCOME

Membership Dues	\$ 69,000.00
Sustaining Exhibit Membership	5,000.00
Metal Progress Advertising	100,000.00
Metal Progress Subscription Sales	4,000.00
Bound Transactions	4,000.00
Reprints	3,000.00
Books Purchased	1,500.00
Books Published	6,000.00
National Metals Handbook Sales	2,000.00
Extension Division	7,000.00
Interest Earned	8,712.50
Discount Earned	1,500.00
Sundry Income	340.00
National Metal Exposition	75,000.00
Western Metal Congress	25,000.00
	\$312,052.50

EXPENSE

Apportionment of Dues to Chapters	\$ 30,000.00
Support of Chapters	1,000.00
Metal Progress	104,300.00
Transactions	11,200.00
Review	4,500.00
Reprints	2,000.00
Books—For Library	100.00
Purchases for Resale	1,200.00
Books Published	1,000.00
National Metals Handbook	3,500.00
Howe Medal Fund Expense	25.00
Campbell Memorial Lecture	500.00
Extension Division	5,000.00
Western Metal Congress	25,000.00
National Committees	5,000.00
Directors' Expense	3,500.00
President's Office	1,000.00
Treasurer's Office	6,500.00
Audit	600.00
Secretary's Office	28,500.00
General Expense	12,500.00
Reserves	127.50
Convention	65,000.00
	\$312,052.50

DIRECTORS MEETING REPORT

(Continued from Page One)

Assistant-Secretary Bayless showed that a total of approximately 45 contributions had been assured and further invitations had been extended and would probably be heard from at a later date.

Assurances have been received from a number of societies that they plan to cooperate in the National Metal Congress at Boston, as in the past, and prospects for a most satisfactory convention are rapidly materializing.

It was reported that the floor plans and space applications for the Boston exposition would be forwarded approximately April 1.

A communication was read from Mr. L. B. Crossman stating that the American Gas Association would require approximately 10,000 square feet in order to present properly their display of industrial gas appliances.

A. W. S. Again in Congress

The secretary then read a letter received from Mr. E. A. Doyle giving assurance that the invitation to the American Welding Society to participate in the National Metal Congress to be held in Boston the week of September 21, 1931, has been accepted.

The secretary presented a report on extension work conducted in cooperation with Purdue University.

The first 2 groups held by Mr. Keller resulted in very satisfactory returns.

The first part of 1931 found Mr. Keller conducting groups in St. Louis and the Detroit territory.

The attendance this year has been somewhat influenced by business conditions. Nevertheless, the attendance and results of this extension work have been satisfactory.

A report on proposed group meetings for the coming year was presented to the board indicating that such meetings are contemplated being held in Columbus, Hartford, Philadelphia, with the possibility of one in Rockford.

The board of directors went on record as approving these sectional meetings held under the auspices of the local chapters, feeling that they contributed largely to the solidarity of the territorial units and contributed much to the benefit of the local and national units of the Society.

Membership Directory Considered

A communication was received from Mr. Howard Staggs suggesting that a membership directory similar to that published by the Iron and Steel Institute of Great Britain be published by the A. S. S. T. This communication was endorsed by chapter communications from the Detroit, Philadelphia, and Lehigh Valley chapters.

Upon motion properly made, seconded, and unanimously carried, the board of directors decided it was inadvisable to publish a membership list at this time for the following reasons:

1. The publication of year-books by other societies is, to a great extent, an inherited activity which they cannot avoid giving to their members now, even though they may be inclined to feel it is not necessary or desirable.

2. The preparation of a membership roster, due to the intense clerical activity necessary in order that it may have the very latest information about members and also in order that as few as possible changes of address may be omitted, requires an independent additional clerical force, which is expensive.

3. The cost of the preparation and distribution of this list to all the membership would be at least \$7,000.00.

4. No source of income to offset this item of expense is possible in a membership roster as it does not represent a worth while advertising medium.

5. It is felt that only a limited small percentage of the membership would find the year-book of any decided help or advantage to them and that this limited small percentage of the membership would be quite largely those engaged in sales activities and such other members of firms as might desire to circularize the membership without advertising in the Society's publications.

6. Inasmuch as all advertisers in *Metal Progress* or the *Handbook* have the privilege of securing the mailing list at the cost of its production, it is felt that those desiring to reach the membership with a direct-mail campaign to reinforce their A. S. S. T. publications advertising can do so at a minimum of expense.

7. If a membership roster was prepared which would be available for sale only, it was estimated that the sale would consist of approximately 500 copies and that 75 per cent of these 500 copies would go to salesmen and firms desiring the mailing list.

In the event that a roster was prepared for sale, the cost of its production would still represent a cost to the entire Society of approximately the amount indicated above.

8. It was felt that the names of the membership in the Society was its most valuable asset and that it would be detracting largely from the efficiency of regular A. S. S. T. advertising media to permit every Tom, Dick, and Harry who wanted to circularize the membership to have the list.

9. Practically all of the chapters of the A. S. S. T. publish chapter mem-

bership rosters which, in a number of instances, supply the information most necessary and desirable, and that is to indicate to prospective members those who are already enrolled and also to indicate to those already enrolled who their fellow-members are.

A communication was presented inviting the A. S. S. T. to take out a membership in the American Standards Association, which would entitle the Society to a representative on the American Standards Committee.

After thorough consideration it was moved, seconded, and unanimously carried that the A. S. S. T. should not take out a membership in the American Standards Association at this time.

Official notice was received from the Division of Engineering and Industrial Research of the National Research Council stating that the term of H. M. Boylston, A. S. S. T. representative, expired June 30, 1931, and that he having served a 3-year term was not eligible for re-election.

Upon motion properly made, seconded and unanimously carried, Mr. R. S. Archer was selected as the representative of the A. S. S. T. on their committee for a 3-year period beginning July 1, 1931.

A communication was received from the Recommended Practice Committee asking suggestions from the board of directors as to the proper method of procedure when members of the Recommended Practice Committee, as well as members of the various sub-committees, consistently refrained from attendance at the regularly-called meetings.

Upon motion properly made, seconded, and unanimously carried it was moved that when a member of the Recommended Practice Committee has been absent for 2 consecutive meetings without a written explanation the secretary of the Recommended Practice Committee is to notify the secretary of the Society and he in turn is to communicate with the president for such action as the president may deem expedient.

Upon motion properly made, seconded, and unanimously carried the board adopted the following resolution:

"That the title to individual membership, the dues for which are paid by firms, rests in the name of the individual member during the period covered by the dues and is not subject to transfer by the firm from one individual to another. However, this ruling does not apply to sustaining memberships. The firm or corporation paying the dues has the privilege to change the representative on that membership as desired."

Several communications were received from Mr. Howard Staggs suggesting that the constitution of the Society be changed to provide:

1. That there be a general manager of the Society employed by the board of directors and elected by the Directors and

2. That the position of secretary of the Society be one without salary, the holder of which should continue to be nominated and elected, as at present.

It was moved, seconded, and unanimously carried that Mr. Staggs be informed that the board felt his point was excellent but that the mechanism is already in existence by which the board of directors have the privilege of creating the position of general manager with salary, leaving the position of secretary as an honorary one, and that Mr. Staggs further be informed that the board contemplate availing themselves of such power as soon as the occasion arises or necessity demands.

Proposed Nominating Change

The secretary then read a letter from the Detroit chapter relative to representation on the National Nominating Committee. This letter was as follows:

"To the Board of Directors
American Society for Steel Treating
Cleveland, Ohio
Gentlemen:

At a meeting of the Executive Committee of the Detroit chapter of the American Society for Steel Treating held January 16, 1931, a resolution was passed protesting against the present system of representation used in electing National Officers.

"It was unanimously agreed that the voting power of the membership of the American Society for Steel Treating should be determined by proportional representation of members and not by chapters as it is now.

"It is believed that the present system whereby each chapter is allotted one vote regardless of the number of members who belong to the chapter is unfair and contrary to the best interests of the National Society.

"We hereby recommend that the National Board of Directors give very serious consideration to the proper representation of the membership and ask that action be taken at the next meeting of the Board of Directors and the results of such action be made known to the membership at large.

Yours respectfully,

American Society for Steel Treating
(Signed)

J. W. Robinson, Chairman
H. W. McQuaid, Secretary."

President Watson reported that he was in receipt of a communication from Mr. D. O. Richardson in which similar sentiments were voiced.

No action was taken on this motion at this time. It was deferred as un-

finished business for the next session of the board.

Upon motion properly made, seconded, and unanimously carried, President Watson appointed a sub-committee consisting of Messrs. Fulton, Drake, and Eisenman to prepare a budget for presentation to the board at its adjourned meeting.

Upon motion properly made, seconded, and unanimously carried the meeting was adjourned until Tuesday at 12:30.

Meeting of the
Board of Directors
February 17, 1931
Cleveland, Ohio

Present:

J. M. Watson
R. G. Guthrie
F. B. Drake
A. Oram Fulton
O. E. Harder
W. B. Coleman
A. H. d'Arcambal
B. F. Shepherd
W. H. Eisenman

The minutes of the previous meeting of the board held on February 15 were read by the secretary and approved.

The next subject under consideration was the unfinished business from the previous meeting relative to change in the constitution governing representation on the Nominating Committee, report on which was read at the previous meeting.

It was moved, seconded, and unanimously carried that this subject be turned over to the Constitution and By-Laws Committee, and that if possible a definite plan be submitted to the board at their next meeting.

It was further suggested that a copy of the statement accompanying this report be forwarded to the Constitution and By-Laws Committee with the statement that it did not necessarily represent the opinions of the board but was submitted as a possible basis for the Committee's deliberation.

This report was as follows:—

PROPOSAL RELATIVE TO CHANGE IN THE CONSTITUTION GOVERNING REPRESENTATION ON THE NATIONAL NOMINATING COMMITTEE

The following letter from the executive committee of the Detroit chapter is self-explanatory:

(Read letter from Detroit)
There are 37 units in the chapters and groups of the Society. Three of them

Notre Dame
Fort Wayne
York

are still operating as groups, leaving 34 chapters entitled to 1 representative each on the National Nominating Committee.

The following 9 chapters represent approximately 3500 of the 6339 members:

Chicago	552
Detroit	489
Pittsburgh	484
Cleveland	401
New York	363
Philadelphia	358
New Jersey	291
Boston	281
Los Angeles	247

The following 11 chapters have membership from 102 to 169 as follows:

Golden Gate	169
Hartford	161
Milwaukee	147
Lehigh Valley	141
Ontario	140
Montreal	121
Buffalo	120
Cincinnati	118
New Haven	118
Tri-City	107
Canton-Mass.	102

TOTAL 1444

The following 14 chapters entitled to vote have the following members, all of them under 100:

St. Louis	97
Worcester	97
Washington	90
Syracuse	86
Schenectady	83
Indianapolis	81
Dayton	80
Rhode Island	78
Rochester	76
North-West	65
Columbus	60
Rockford	58
Springfield	51
Southern Tier	50

TOTAL 1050

In other words, 25 chapters representing approximately 2500 have 25 votes on the Nominating Committee as compared with the chapters representing 3500 members having 9 votes.

In order to change the representation on the National Nominating Committee a constitutional change must be effected.

It is necessary to bear in mind that the 25 chapters will probably raise very strenuous objections unless some safeguard is placed on the representation from the various so-called 9 larger chapters, chapters which, in a great number of instances, by combination might be able, and probably would, to control a sufficient number of votes to elect their candidate.

(Continued on Page Four)

EASTERN CHAPTERS WILL MEET MAY 15

Philadelphians to Entertain with Big, Eventful Program

Plans are well under way towards making this year's Eastern Group Chapter Meeting the biggest and best ever. The Lehigh Valley, New Jersey, New York, Philadelphia, and York chapters plan to get together for an all-day session on Friday, May 15th. It falls on Philadelphia to be host on this occasion, and much work has already been done to make the day a success.

Led by Chairman Peterson of the Philadelphia chapter, six committees have been formed to take care of the various phases of the day's activities. The tentative schedule includes registration at the Penn Athletic Club at 10 A. M. It is planned to hold a technical session in the morning with an outstanding speaker and a talk that will command the interest of the entire Society. The meeting will be followed by luncheon, the expense of which will be borne by one of the chapter's Sustaining Members.

Following luncheon, the group will visit the Philadelphia Navy Yard. There will be a trip through the large modern aircraft factory there, which will probably include an exhibition of stunt flying. Forge shops, machine shops, heat treatment shops in the various departments of the yard will be open for inspection. It is hoped that various types of ships will be docked at that time, and opened to the members present.

Following the Navy Yard trip, a dinner will be held at the Penn Athletic Club. Several of the national officers will be present. An entertaining after dinner speech will bring the meeting to a close at 8:30 on the dot, so that the visitors may have plenty of time to get home.

All members of the Society will be welcome at this meeting, but they should communicate in advance with the secretary of the Philadelphia chapter for reservations. Further details of the program will follow.

DESCRIBES X-RAY'S PLACE IN INDUSTRY NOW AND IN FUTURE

E. W. Page Talks at Tri-City

By G. Phillips

The use of the X-ray in metal industries was described by E. W. Page of General Electric X-Ray Corp. at the February meeting of Tri-City chapter.

Utilization of the X-ray enables foundrymen to quickly find defects in the interior of castings and to correct the cause of the defects. A few foundries today use the X-ray to work out the proper molding methods and gating before starting production on the part. Welded parts are easily and quickly examined for gas holes, inclusions, etc., on the interior of the welds and the quality thus determined.

Structure and crystalline arrangement of all kinds of metals are studied with the X-ray and facts determined that cannot be found with the microscope or by chemical analysis.

It is possible at present to examine the interior of a piece of steel 2-5 inches thick and with the use of higher voltages this thickness will be increased. Mr. Page predicted that eventually the X-ray will be used as a routine inspection tool for incoming raw materials and outgoing products in practically all metal industries as the demand for better quality increases.

REGULATOR CO. ADDS LINE

Minneapolis-Honeywell Obtains Assets of the Time-O-Stat Controls Corp.

The Minneapolis-Honeywell Regulator Co., Minneapolis, has acquired all the assets and business of the Time-O-Stat Controls Corp., the latter organization to be operated as a division of the Minneapolis Company.

The Minneapolis-Honeywell line will now comprise the Time-O-Stat gas hot-water heater control, mercury tube switch devices, refrigeration controls, and electric sign flashers, in addition to its former line of damper regulators, controls for oil or gas burners, unit heater and sectional controls, stoker controls, individual radiator controls, and motorized valves and controllers for industrial processes.

NICHOLAS ELBOGEN PASSES CIGARS

Nicholas Elbogen, member of the New Haven chapter and gas sales engineer for the Derby Gas and Electric Co., proudly announces that he is the father of a healthy baby boy, Robert Malcolm, born Feb. 4.

220 MEN ATTEND FEBRUARY 3 NEW JERSEY CHAPTER MEETING

C. Morris Johnson Guest Speaker

By D. H. Sheridan

The regular meeting of the New Jersey chapter occurred on Feb. 3. This was indeed a rousing good meeting. At the dinner before the meeting there was an attendance of ninety members and guests.

C. Morris Johnson, chief chemist of Crucible Steel Co. of America, Pittsburgh, spoke on the subject of "Stainless and Heat Resisting Steels." Two hundred and twenty members and friends attended this meeting and were well repaid for their attendance. (It would be well to mention that our membership has passed the 300 mark).

Previous to the main talk of the evening a movie entitled "The Story of Ingot Iron" by the American Rolling Mill Co. was presented. These educational pictures are proving a subject of interest to the members.

The course in Heat Treatment, Metallurgy and Use of Iron and Steel is progressing in excellent shape. The attendance at each meeting is increasing and we are averaging close to one hundred people.

NELSON TELLS WHY STEELS FIGHT RUST

Big Group in Rochester Hears Talk on Steel vs. Corrosion

Vivid recollections of a talk delivered five years ago before the Rochester chapter by T. Holland Nelson, consulting metallurgist for the Midvale Steel Co., brought out that chapter in full force for the January meeting. Mr. Nelson was again the speaker and it was unanimously agreed that he fully lived up to expectations. All the members expressed the hope that it would not be five years before he would again address the Rochester chapter.

Mr. Nelson's topic was "Corrosion and Heat Resistant Steels." Since corrosion is the result of oxidation and galvanic action, a corrosion resistant steel must be insoluble in the medium in which it is to be used and possess a homogeneous structure. Fundamentally, these same principles apply to heat resistance as well, since the same physical and chemical forces are involved in both cases. The importance of the solubility of the carbides and the effect of this property on corrosion resistance were greatly stressed.

Opinion differs as to the distinction between stainless steel and stainless iron. Many of the so-called stainless irons of the .10% carbon and 12-14% chromium type are subject to hardening by heat treatment and therefore cannot be classified as true irons. The real stainless irons are those containing upwards of 16% chromium which are incapable of being hardened by heat treatment.

Great emphasis was placed on the fact that there is at present no one alloy that will satisfactorily meet all conditions. Each problem requires careful investigation and the chemical and physical properties of the alloy varied to suit the conditions of the application. Rarely is it possible to use the ideal alloy from the standpoint of heat and corrosion resistance on account of the other factors involved, such as strength, machineability, fabrication, etc. Most heat and corrosion resistant steels are the result of a compromise and it is only on this basis that satisfactory performance can be obtained.

Mr. Luerssen expounded the very interesting theory on definition of timbre in steel. Some of the slides used by Mr. Luerssen were given him by Mr. Shepherd and the explanations which were made showed that the thorough chemical analysis procedures have very little bearing on the behavior of a given series of tool steels.

Mr. Luerssen pointed out nine different considerations which should be made before deciding to use a carbon tool steel for any given purpose.

TOOL STEELS TALK FEATURES JANUARY NORTHWEST MEETING

W. H. Wills Addresses Chapter

By A. C. Forsyth

W. H. Wills, metallurgist for the Ludlum Steel Co., was the speaker at the January meeting of the Northwest chapter. The material in his talk was well chosen, well organized and clearly presented. He divided tool steels into six main groups or divisions, water hardening, oil hardening, low tungsten finishing, shock resisting, die and high speed steels. Each division was described as to composition, properties to be expected and general uses. Mr. Wills also gave the composition and properties of many special tool steels and pointed out peculiarities, advantages and disadvantages common to each kind.

The speaker then discussed many departments of the steel industry such as the rolling mills, steel mills, fabricating plant, tube mills, etc., and outlined the kind of tool steels commonly used.

NEW JERSEY MEMBER RECEIVES R.W. HUNT PRIZE FROM A.I.M.E.

Edmund S. Davenport Honored

The Robert Woolston Hunt prize awarded annually by the American Institute of Mining and Metallurgical Engineers was received this year by a member of the New Jersey chapter,



Edmund S. Davenport, member of the metallurgical staff of the U. S. Steel Corp. Research Laboratory at Kearny, New Jersey. Mr. Davenport was co-author with Dr. E. C. Bain, his superior at the Steel Corp.'s laboratories of a paper "Transformation of Austenite at Constant Sub-Critical Temperatures". Inasmuch as Dr. Bain, a member of the New York chapter and a well-known figure in American Society for Steel Treating technical activities, had previously received the Hunt prize, it was given this year to Mr. Davenport.

Mr. Davenport is a graduate of Sheffield Scientific School of Yale University and has been in metallurgical work since 1921, devoting himself chiefly to research. His home is in Newark.

Dr. Bain, co-author with Mr. Davenport, is a member of the New York chapter, and has frequently been seen on the programs presented at National meetings of the American Society for Steel Treating.

LUERSSEN AT YORK ON JANUARY 14TH

Chapter Hears Definition of The Timbre Of Steels

By A. W. F. Green

The January meeting of the York chapter was held at York on Jan. 14. We were to have been addressed by B. F. Shepherd, chief metallurgist of the Ingersoll-Rand Co. and director of the Society, on the subject, "Steel Personality," but at the last minute Mr. Shepherd was compelled to cancel his engagement, owing to illness, and we were fortunate in securing in his place G. V. Luerssen, metallurgist with the Carpenter Steel Co., Reading, Pa., who was able to talk on the same subject because of the great amount of work which he has done in collaboration with Mr. Shepherd.

Mr. Luerssen expounded the very interesting theory on definition of timbre in steel. Some of the slides used by Mr. Luerssen were given him by Mr. Shepherd and the explanations which were made showed that the thorough chemical analysis procedures have very little bearing on the behavior of a given series of tool steels.

Mr. Luerssen pointed out nine different considerations which should be made before deciding to use a carbon tool steel for any given purpose.

CLEVELAND CHAPTER LEARNS DEVELOPMENTS IN RESEARCH

Drs. Boylston and Jeffries Speak

By W. E. Benninghoff

The dinner preceding the regular meeting of the Cleveland chapter was held in Kaese's Restaurant, where 60 members and guests gathered to hear Dr. Zay Jeffries give a coffee-talk on "Ultra Violet Radiation."

Dr. Jeffries gave further proof of his versatility in telling us about "Ultra Violet Radiation," what it is, what its sources are, and what effects it has especially on the human system.

Chairman Ayling then introduced to 150 members and guests the speaker of the evening, Professor H. M. Boylston of Case School of Applied Science, who spoke on "Research." Prof. Boylston first defined research, and then distinguished between pure and applied research. The growth of research in this country was then shown, and quotations were given from several sources to indicate the attitude toward research.

He continued in telling what the requirements are for success in the research field and what developments have been made in research equipment and methods.

300 CHICAGOANS CELEBRATE A "PRESIDENT'S NIGHT"

A.S.S.T. Head, J. M. Watson, Talks

The setting for President's Night at the Chicago chapter was especially fitting inasmuch as the new president, J. M. Watson, received the official chapter welcome from R. G. Guthrie, retiring president and a member of Chicago chapter. Further background was added by the presence of Past President J. Fletcher Harper of Milwaukee.

After considerable left-handed complimenting back and forth, Mike Watson presented Bob Guthrie with a unique gift calculated to be useful as well as novel in these times.

Founder Member T. E. Barker was called on from the floor and he responded with reminiscences of early days of the Society. S. M. Havens acted as technical chairman and introduced Mr. Watson as the speaker of the evening.

Mr. Watson spoke on "Automobile Steels." His paper was extremely well received and produced a great deal of discussion. Those desiring to read this paper will find it in the February issue of *Metal Progress*.

Approximately 300 members and guests attended the meeting.

IONS OF HYDROGEN HASTEN CORROSION

Concentration of Ions, not Acid, Rusts, Lehigh Hears

By O. V. Greene

R. J. McKay, superintendent of technical service of the International Nickel Co., New York, in a talk before the Lehigh Valley chapter of the A. S. S. T. on Jan. 9th, gave a very comprehensive account of the variables encountered in corrosion study. Mr. McKay was assisted by F. L. LaQue.

The reasons for unrelated and often erroneous results in corrosion studies were made entirely clear by Mr. McKay. Six important characteristics of a corrosive medium must be considered: acid content of corrosive medium; oxidizing content of corrosive medium (air); galvanic and concentration cells; films; motion; temperature and pressure.

A detailed account of these factors was then given.

The corrosive action of an acid is not dependent upon concentration as such, but upon the hydrogen ion concentration. Dissociation is not proportional to concentration in all acids.

The presence of air in a corrosive medium may either increase or decrease the rate of corrosion according to the type of metal under observation. With metals at the anodic end of the electro-motive series, the corrosion rate is decreased due to the properties of the oxides formed.

Both galvanic and concentration cells produce what is known as electrolytic corrosion. The motive force in galvanic cells is from dissimilar metals and in concentration cells dissimilar solutions.

Metals and alloys toward the anodic end of the series have a greater affinity for oxygen than those at the other end. Consequently in the presence of air or aerated solutions protective oxide films are formed. In general films protect the metal by making it more cathodic.

The motion of a corrosive medium is of great importance, since it removes the end products of the reaction and brings fresh solution in contact with the metal.

The speed of all chemical reactions increases with temperature. Corrosion likewise increases with temperature.

W. H. WILLS NAMES SIX GENERAL TOOL STEEL CLASSIFICATIONS

Addresses Meeting in Dayton

The January meeting of the Dayton chapter was held at the Engineers' Club of Dayton. A large number of members attended the dinner and were entertained by a coffee talk on Bakelite.

The feature of the evening was a talk by W. H. Wills, Ludlum Steel Co., on tool steel applications. Mr. Wills classified tool steels in six general types. The chemical analysis of each type was given along with the variations which are found in the commercial field. He then went on to give illustrations of where each classification found use, giving the properties which are inherent in the particular analysis and showing how these properties were utilized.

Many individual cases were cited of how the correct steel was found for each kind of tool. Failure of different tools was then discussed in relation to its classification and properties. Several such cases were illustrated by slides.

STEEL COMPOSITION EXPLAINED BY GILL

Ontario Speaker Tells Effect of Elements on Tool Steel

The February meeting of the Ontario chapter was addressed by J. P. Gill, chief metallurgist of the Vanadium Alloys Steel Co., and the Colonial Steel Co. The subject of his paper was "The Chemical Composition of Tool Steels."

Carbon, he said, is in many respects the most important element in steel and is more influenced by heat treatment than any of the other elements.

Chromium raises the critical temperatures on heating and increases hardness by forming carbides. It also increases the depth of hardening. While it helps to increase the hardness it does not cause as much brittleness as carbon, but toughens the steel, gives it a finer grain and reduces soft spots. It is also used with many of the other alloying elements such as vanadium, tungsten, molybdenum and silicon.

Nickel dissolves in the iron, increases the strength and toughness and lowers the critical temperatures. It is one of the most important alloying elements for structural work for corrosion resistance and a great variety of other special uses. Its wide use results in a considerable amount finding its way into scrap. As its content in tool steel should be kept below .15% it is necessary to watch the source of the scrap used.

Vanadium not only makes cleaner steel but also prevents grain growth, gives greater toughness, improves fatigue resistance and makes the steel easier to manufacture and treat. Only .45% of vanadium in a carbon steel will increase the depth of hardening at the higher quenching temperatures and prevent grain growth.

Manganese in small quantities is useful in all steels to slag off the sulphur as ferrous sulphide melts at forging temperatures and causes slipping at the boundaries or red shortness, whereas manganese sulphide has a higher melting point. Manganese lowers the critical points, promotes grain growth and makes the higher carbon steels brittle but in spite of its drawbacks it is very useful for special purposes and is cheap. A slight increase in manganese content will change the steel from water to oil hardening.

Tungsten increases hardness as a result of carbide formation and is not only useful in high speed steel due to red hardness but also in fast finishing steels, magnet steels, hot die steels and special chisel steels. In high speed steels the limitation of tungsten is partly due to the high cost and 18% is a good general compromise between the cost and influence on the steels. With more carbon both hardness and brittleness would be greater.

Molybdenum acts like tungsten in high speed steel and also adds toughness, but only half as much is needed to get the same result. It is, however, more difficult to handle, oxidizes and is lost readily.

Silicon is a deoxidizer and also resists corrosion. It makes a very good and inexpensive spring material with manganese. With chromium it resists corrosion of exhaust valves.

Cobalt increases cutting ability in high speed steel but when the amount is increased the effect of the carbon in hardening is decreased.

GEARS NOISY IF .0005 INCH OFF SPECIFIED DIMENSIONS

Davis Tells Southern Tier This

By W. S. Bennett

The regular monthly meeting of the Southern Tier chapter was held Feb. 16 at Jenkins Inn, Waverly, N. Y. Dinner was served at 6:30 P. M. to forty members and guests.

The principal speaker was E. J. Davis of the Warner Gear Co., Muncie, Ind., who spoke on the heat treatment of gears and the requirements of steel for the making of gears. He pointed out that the inaccuracies which occur in gear making are not due entirely to the heat treatment but that small errors creep into the gear manufacture in the various steps through which it must pass, from forging to heat treatment, and if the total of all of these errors exceed five ten-thousandths of an inch the gear will be noisy.

Mr. Davis' talk was well received by the members and was followed by considerable discussion.

W. K. LEACH GENERAL ALLOYS V. P.

General Alloys Co., Boston, Mass., and Champaign, Ill., has announced that W. Kimball Leach, formerly general manager of the company, has been elected first vice-president. Mr. Leach joined the General Alloys organization in 1923.

DIRECTORS MEETING REPORT

(Continued from Page Two)

While this is not logical, inasmuch as the larger cities in the various geographical locations are to a certain extent looked upon as the leaders of that particular territory, nevertheless it is a condition which the smaller chapters would view with alarm unless their rights were properly safeguarded.

If representation on the National Nominating Committee was made on the basis of 1 representative from each chapter entitled to cast as many votes as there were units of 100 members or major fraction thereof, the number of votes in each of the groups before mentioned would be as follows (according to the report as of January):

Chicago	6
Detroit	5
Pittsburgh	5
Cleveland	4
New York	4
Philadelphia	4
Boston	3
New Jersey	3
Los Angeles	2

TOTAL 36

The second group of 11 chapters on same basis follows:

Golden Gate	2
Hartford	2
Milwaukee	1
Lehigh Valley	1
Montreal	1
Ontario	1
New Haven	1
Buffalo	1
Cincinnati	1
Canton-Mass.	1
Tri-City	1

TOTAL 13

The remaining 14 chapters would have 1 vote each inasmuch as their membership is below the hundred unit but each chapter entitled to vote would have at least 1 vote. On the Nominating Committee there would then be a total of 63 votes.

Following are suggestions:

1. If a constitutional change is desired, approved by the Constitution and By-Laws Committee, that this be submitted to a letter-ballot of the membership rather than be handled at the annual meeting.

The constitution permits changes to the constitution to be effected either by letter-ballot or by action at the annual meeting.

2. That as a protection for the smaller chapters a proviso be made that, with the exception of the chapter supplying the treasurer and secretary, no chapter be represented on the board by any more than 1 member at any 1 time.

It might be advisable to include a further recommendation that no chapter except the home chapters of the secretary and treasurer should have continuous representation on the board in an elective office for any period in excess of 4 years.

This applies only to elective offices and does not apply when a president automatically becomes a member of the board of directors.

The 4-year period would provide for 2 years on the board of directors, 1 year as vice president and 1 year as president and would automatically prevent continuous representation on the board of any 1 chapter.

3. That in any event, even though a chapter may have over 1 vote, the number of individuals representing that chapter be limited to 1 and he should have the privilege of casting the ballot for that chapter of the number of votes to which the chapter is entitled.

4. That the apportionment of representatives on the National Nominating Committee be as of a specific date such as July 1 and that the chapter secretaries be notified immediately by the national office as to the number of votes to which each chapter is entitled.

5. To effect a nomination of a candidate it is suggested that some provisions be made such as he must receive a majority of votes represented in the meeting and also a majority (this might be changed to a percentage) of the chapters represented.

The next order of business was the consideration of the treasurer's report for the year.

Treasurer Fulton called attention to the fact that at the September meeting the board had authorized the finance committee to enter into a trusteeship for the funds of the Society. However, upon investigation it was found that according to the laws of Ohio it was impossible for the board of directors of the A. S. S. T. to delegate this authority to a bank.

Upon motion properly made, seconded, and unanimously carried it was decided that the present method of operation of the funds and investments of the Society should be continued.

Upon motion properly made, seconded, and unanimously carried it was agreed to eliminate the clause about educational requirements of members from application blanks.

Upon motion properly made, seconded, and unanimously carried the meeting was adjourned.

proved, subject to final check by Ernst & Ernst, auditors.

The treasurer then submitted the unaudited profit and loss statement of the 1930 exposition and upon motion properly made, seconded, and unanimously carried it was accepted, subject to the final check by Ernst & Ernst, auditors.

The unaudited profit and loss statement on the extension division work was, through motion properly made, seconded, and unanimously carried, accepted subject to final check by Ernst & Ernst, auditors.

Upon motion properly made, seconded and unanimously carried \$250.00 bad accounts as submitted by the treasurer were written off.

Upon motion properly made, seconded, and unanimously carried \$250.00 was added to the reserve for bad accounts.

Upon motion properly made, seconded, and unanimously carried, it was voted that the depreciation on office furniture and fixtures be taken at 20 per cent.

The inventory as submitted was, upon motion properly made, seconded, and unanimously carried, accepted.

NOTE: As soon as audit of books has been completed by Ernst & Ernst it will be published in the REVIEW.

The sub-committee appointed by President Watson to prepare the budget then submitted a report.

(The condensed budget appears on page two of this issue)

Upon motion properly made, seconded, and unanimously carried the budget was accepted subject to the approval of the Finance Committee.

Consideration was then given to the publication policy of the Society.

A communication dated November 18, from the Schenectady chapter, copies of which were sent to all the chapters of the Society, resulted in the board of directors receiving communications from 9 chapters, some expressing approval and others disapproval of the policy of charging \$2.50 for the bound volume of Transactions.

The board also considered at this time the entire file of individual membership complaints against Metal Progress which consisted of 28 letters.

After giving the matter thorough consideration it was moved, seconded, and unanimously carried that the contents of the following communication, forwarded to all of the members of the Society, represent the future publication policy of the Society:

(The letter sent to all the membership is reproduced on page one.)

Upon motion properly made, seconded, and unanimously carried the meeting was adjourned until the next day.

Meeting of the
Board of Directors
February 18, 1931
Cleveland, Ohio

Present:

F. B. Shepherd
A. Oram Fulton
W. B. Coleman
O. E. Harder
R. G. Guthrie
A. H. d'Arcambal
J. M. Watson
F. B. Drake
W. H. Eisenman

The letter stating the policy of the Society which was addressed to members was read and approved.

It was moved, seconded, and unanimously carried that this letter be sent to the individual members over the signature of the board, each name being printed on the letter.

Upon motion properly made, seconded, and unanimously carried the secretary was empowered to answer, on behalf of the board, those communications which were ethically written and sent to the board of directors.

Upon motion properly made, seconded and unanimously carried, it was voted that the board write a letter reminding the Schenectady chapter for the unethical manner in which they had handled their communication to the board of directors.

The board of directors went on record as approving the receipt of communications from the chapters relative to the chapters' feelings and suggestions as to what was for the best interest of the society.

The board went on record as thoroughly disapproving of the method used in 2 instances when communications were forwarded to the board of directors who, before having an opportunity to give the matter consideration, were the recipients of communications from other chapters which had been instigated and influenced by the originators of the petition to the board, the purpose being to bring pressure to bear upon the board. In one instance in particular there was a pronounced difference of opinion as to the facts expressed.

Upon motion properly made, seconded, and unanimously carried it was agreed to eliminate the clause about educational requirements of members from application blanks.

Upon motion properly made, seconded, and unanimously carried the meeting was adjourned.

REFRACTORIES AND ABRASIVES TOPICS

Hartford Chapter Interested by Speeches and Discussion

By J. Allison

The Norton Co. of Worcester, Mass., told the Hartford chapter, by speakers and movies, of developments in the manufacture of grinding wheels and of the applications of silicon carbide in refractory bricks and cement at a meeting on Feb. 10 in the auditorium of the Hartford Electric Light Co.

Alphonse O. Rousseau, assistant manager of the sales engineering department, made the principal address on "New Developments in the Abrasive Industry." His talk was followed by a moving picture "Mills of the Gods" which portrayed the formation of lava deposits, their concentration by the action of glaciers, and the development from the hand driven sand stone to the present day high speed wheels of alumina and silicon carbide. A new picture, "Handling of Heat," showed the applications of the same artificial abrasives, for refractory materials.

Two developments which belong entirely to 1930 are an improved classification system for grinding wheels and the introduction of controlled structure. The new classification eliminates much confusion since the wheel number is divided into five positions and the numbers or letters occupying these positions tell the abrasive, grain size, grade, structure and bond.

Controlled structure has not yet been developed to the extent that the various effects of different structures can be described but it is definitely known that two wheels identical in all respects except structure will show vastly different results. Structure describes the distance between grains and the thickness of the bond, and these two factors determine the size of the voids. The development of controlled structure has made it possible to duplicate wheels within very narrow limits. This subject is still under study in the Research Department, which consists of forty-five engineers and scientists, and the Norton Company hopes soon to give out information regarding the cause for the difference in action and properties which results from difference in structure.

Several interesting points were brought up in the discussion which was conducted by I. F. Holland, Superintendent of the Small Tool Division, Pratt & Whitney Co., who acted as technical chairman. Grain size is the mesh of the screen through which the grains will pass; grade is the hardness and is designated by the letters of the alphabet beginning with "A"—very soft.

WINLOCK TALKS ON SHEET, STRIP STEEL

Canton-Massillon Men Learn of the Metallurgical Research

By R. Sergeson

On Feb. 3 the Canton-Massillon chapter met in the Canton Club. The dinner was spiced with songs taken from Broadway's latest hits and some old time favorites. These were given by the Canton Police Octet, and were heartily enjoyed by the members and guests attending.

Dr. George Kelley, our scheduled speaker, was unable to be present. Joseph Winlock, research metallurgist of E. G. Budd Manufacturing Co., who is associated with Dr. Kelley, was our speaker.

Mr. Winlock described with clearness the phenomenon of stretcher strains, grain size, blue brittleness, Stead's brittleness, etc. He explained recrystallizing, temperatures for removal of strain or cold work and for changing entire grain structure. The lowering of the elastic limit by cold work and effect of reheating to 300° F. to restore the elasticity completely was illustrated.

He stated that the normalized sheets had the ability to form all parts required while the box annealed sheets (not previously normalized) were only suitable for certain types of forming.

A film showing the construction of the all welded steel auto body and the sturdiness of such construction concluded his talk.

Dr. C. F. Rossweller, assistant director of the Central Technical Laboratory, E. I. DuPont de Nemours & Co. will speak on "Corrosion" on April 7th before a joint meeting of the Cleveland and the Canton-Massillon Chapter at Canton. An inspection trip will be made in the afternoon through the plants of the Canton Drop Forge Co. and the Hercules Motor Co., both at Canton.

CHAPTER SPEAKER CORRECTS REPORT MADE FROM HIS TALK

Major R. A. Bull is Misconstrued

Editor, THE REVIEW:

In your February, 1931, issue there is a news item regarding my address before the January meeting of the Buffalo chapter. I am quoted as saying, in substance: "When a casting is welded the physical behavior of the weld is changed, the strength is greater but ductility is less, due to slag laminations and oxides."

I would like to correct the impression that I have ever said anywhere that, ordinarily, when a steel casting is welded, its strength is increased over that characterizing the original material. I have said that in the great majority of cases the ultimate strength of weld-metal in a steel casting is less than that typical of the casting proper. This is not necessarily true of all steel parts that are welded, inasmuch as the chemical composition and resulting physical characteristics of the parent material, in comparison with the properties in the weld-metal, have a great bearing on this matter of relative strength.

The particular point that I made in this connection related to the greater loss in ductility than in ultimate strength, generally found in welding steel castings, and indeed many other steel parts.

If there should be available space in your next issue for inserting this correction, your courtesy in providing it would be much appreciated.

Yours very truly,
R. A. BULL.

DISC WHEELS OFFER ENGINEER PROBLEMS

Eksergian Tells Philadelphia of Engineering Metallurgy

By A. O. Schaefer

The Philadelphia chapter was favored at its Jan. 30 meeting with an unusually interesting paper when E. L. Eksergian, chief engineer of the Budd Wheel Co., Detroit, talked on "Engineering Metallurgy as Applied to Automotive Wheels."

Mr. Eksergian stated that the elastic properties of the material determine the performance of the wheel; the plastic properties affect its fabrication. The demand today for minimum weight and cost is so marked that an analysis of the stresses imposed on a material is necessary together with a knowledge of how the material behaves under those stresses. Considerable attention is being given today to the reduction of the unsprung weight of automobiles in order to reduce impact and generally increase design efficiency.

Motion pictures of disc wheel manufacture were shown. The first reel showed all of the stages in the manufacture of the rims. A gigantic machine practically completes the disc manufacture in eight distinct automatic operations. Each operation is synchronized with the others. The final reel showed the assembling of the rim and disc.

An interesting discussion of the fundamentals of wheel design followed. Slides showed the analysis of the stresses imposed on automobile wheels, and the development of a machine for testing wheels by a system of loading similar to that encountered on the road. The rolling process as applied to disc wheels was described at great length from a theoretical as well as a practical viewpoint.

Mr. Eksergian brought with him a great many examples of wheels, both of the disc and wire types, some of them sectioned to show their construction.

CHAPTER MEMBERSHIP STAND

Chicago	553
Detroit	488
Pittsburgh	483
Cleveland	394
Philadelphia	359
New York	355
Boston	273
2.	
New Jersey	300
Los Angeles	244
Golden Gate	170
Hartford	158
Milwaukee	142
Lehigh Valley	138
Buffalo	122
Montreal	117
Cincinnati	117
Canton-Mass.	104
St. Louis	94
Syracuse	84
Indianapolis	80
Dayton	76
North-West	66
National	265
3.	
Ontario	140
New Haven	115
Tri-City	104
Worcester	94
Washington	91
Schenectady	77
Rhode Island	77
Rochester	76
York	61
Columbus	60
Rockford	57
Springfield	51
Southern Tier	47
Notre Dame	39
Fort Wayne	18

OUTLINES USES OF ALUMINUM ALLOYS

E. H. Dix, Jr., Talks Before 125 in Boston at Feb. 6 Meeting

By Howard E. Handy

The February meeting of the Boston chapter was held at Massachusetts Institute of Technology, Cambridge, on Feb. 6, about 125 members and guests being in attendance.

The speaker of the evening was E. H. Dix, Jr., metallurgist of the Aluminum Co. of America, New Kensington, Pa., who presented a talk entitled "Aluminum Alloys and Modern Developments." Mr. Dix prefaced his talk with a short film showing the new water-power project of his company on the Saguenay River, Province of Quebec.

He then reviewed briefly the early history of the development of aluminum and followed with a discussion of the characteristics of the important aluminum alloys together with the influence of heat treatment on the mechanical properties and corrosion resistance.

The application of aluminum alloys to a variety of fields such as transmission lines, transportation, furniture and architectural uses was considered by the speaker, after which he showed several pictures taken in the new research laboratory at New Kensington and described some of the developments being made there which will have a far-reaching effect on future engineering construction. An interesting discussion followed the presentation.

Prior to the meeting a dinner was held in Walker Memorial for about fifty members and guests, following which J. L. Faden, industrial heating engineer for the Edison Electric Illuminating Co., and a member of the Boston chapter, showed several reels of motion pictures taken by him on a recent trip to the Pacific Coast. Both the dinner and meeting were presided over by the chairman, Dr. G. B. Waterhouse.

TELLS CHARACTER OF FOUNDRY SAND

Columbus Members Interested by A. A. Grubb's Discourse

By L. H. Marshall

A. A. Grubb, metallurgical engineer and foundry consultant, addressed the Columbus chapter on the subject of recent advances in sand control.

Sands are selected on the basis of fineness, clay content and resistance to heat. While chemical composition may indicate important properties, such as fusibility and possibly hardness, actual fusion and abrasion tests are usually more satisfactory.

The properties of permeability and bonding strength, while tempered and when dry, are determined largely by particle size. The terms gravel, grain, silt, clay and colloids are used to describe materials as determined by the size of the bodies of which they are composed. These sizes range from a quarter inch down to less than a millionth of an inch. The very finely divided material called "colloid" is responsible for the plasticity of a sand or clay, gives it the "velvety feel" of a good molding sand and provides much of its green bond strength and all of its dry bond strength.

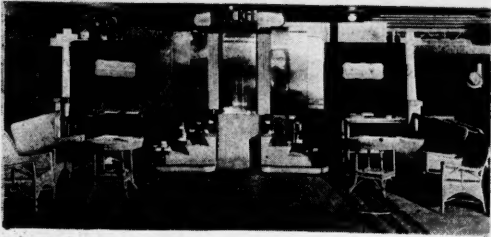
Clay is a major factor in sand control because it determines or affects every molding property. Clays differ widely in resistance to heat and in plasticity. Not only do some fuse at lower temperatures than others but many give up their combined water at temperatures as low as 600 to 800 F. and become worthless as bonding agents.

The so-called "lean" sands and clays have but little colloidal material. Sticky clays are rich in it. Direct strength tests on sands bonded with highly colloidal clay are sensitive to many apparently insignificant variables, so difficulty is experienced in making satisfactory comparisons of clays that are on the market. The speaker has been investigating the moisture absorbing properties of clays as a measure of their colloidal properties and their bonding value.

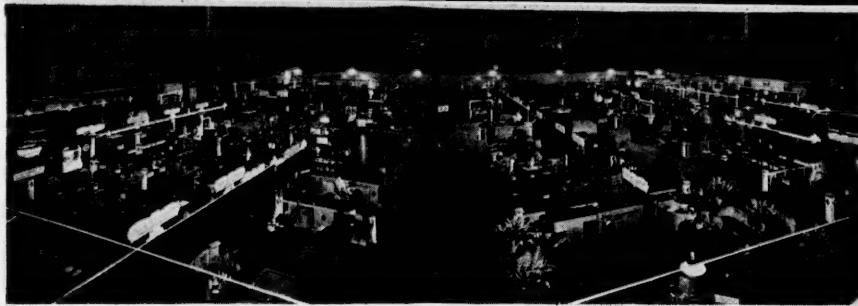
The speaker recommended that the selection of sands and clays should be based not only on their fineness and clay content but also on the quality of their clay substance, its durability and colloidal properties. Lean clays are easier to use, more fool-proof, but by using smaller quantities of sticky clay fusion points are less affected and less silt is introduced in the sand heaps.

A small proportion of fines or silt is desirable in molding sand; it braces the grains, makes the sand less brittle, and keeps it from drying out too rapidly.

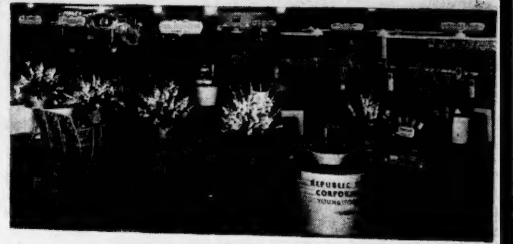
SOME SCENES AT WESTERN METAL EXPOSITION



Polished



General View

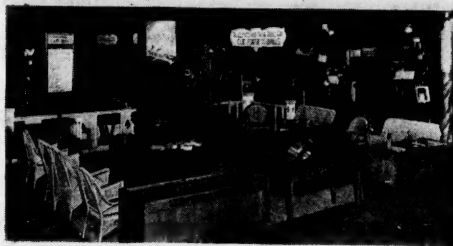


Colorful



Shop-like

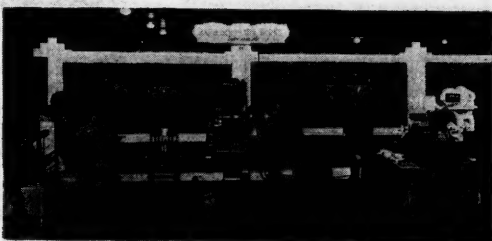
Morton Photographs



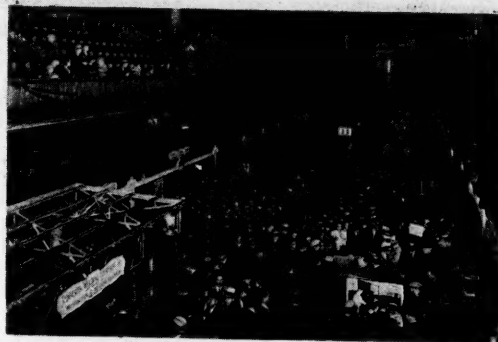
Drilled



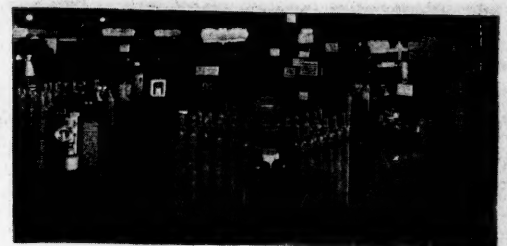
Precise



Man-size



Mobbed



Orderly

San Francisco

1931



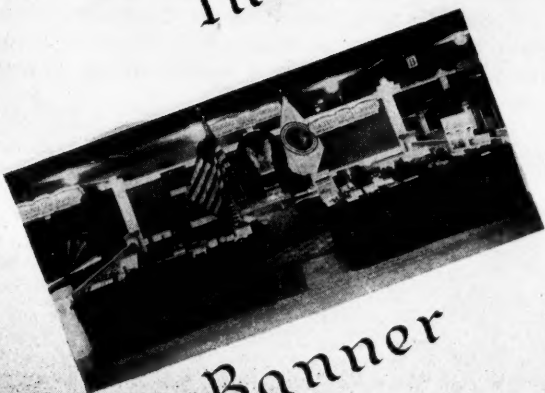
Inviting



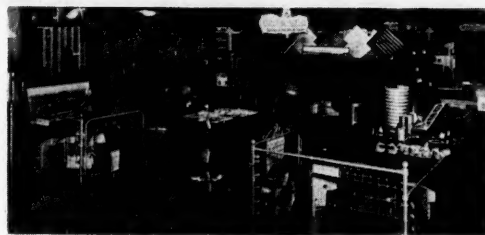
Sawing



Diversity



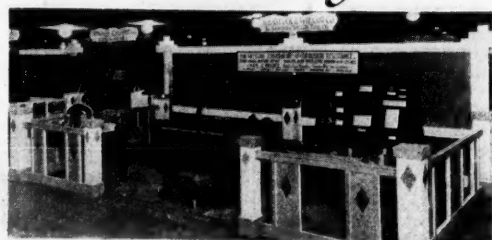
Banner



Variety



Complete



Attractive

WESTGREN PICTURES CRYSTAL STRUCTURE

Scientist Tells Washington-Baltimore Latest Findings

By Leo J. Waldron

The February meeting of the Washington-Baltimore chapter was held in Washington. Dr. Arne F. Westgren, professor of chemistry at the University of Stockholm, was guest speaker. The dinner preceding the meeting gave the members opportunity to meet Dr. Westgren.

Later Dr. Westgren spoke on "The Crystal Structure of Ordinary and Alloyed Steel." Added interest was given the talk by the fact that the speaker has been engaged for many years in extensive X-ray investigations of alloys and their systems and today is considered one of the foremost authorities on the subject.

He first gave a general survey of the field of research on crystal studies covering the work carried out in both Europe and this country, particularly that concerning the four patterns of iron and the structure of carbides. He discussed the X-ray studies at Stockholm with Phragmen's camera involving the diffraction patterns obtained by the quenching and tempering of series of both carbon and alloy steels, with emphasis upon the various atomic arrangements of austenite, martensite, troostite, etc.

Mention was also made of studies covering cold-worked materials as some of the austenitic corrosion-resisting alloys. His discussion of alloy steel covered the phase changes occurring in iron by the additions of the common alloying elements.

MOST INDUSTRIES REGULATE HEAT WELL, TRI-CITY HEARS

Bennett March Chapter Speaker

A discussion of pyrometers and temperature controls, given by T. C. Bennett of Leeds and Northrup Co., Philadelphia, was the feature of the March meeting of Tri-City chapter A. S. S. T.

Accurate temperature recording and control equipment is being used today in almost every industry. Modern bakeries, oil refineries, ceramic industries, diamond mining companies, cement companies, glass industries are a few of the users of accurate temperature control equipment today. In a majority of the cases a small variation due to lack of temperature control may mean a decided loss in efficiency of operation or even failure. A practical explanation of the optical pyrometers used to measure temperatures above 2700° F. and the various types of thermocouples used for temperatures up to 2700° was given and automatic control devices explained by Mr. Bennett.

A brief but extremely interesting coffee talk was given by Martin Nelson, U. S. Army Engineer, on the proposed dam and locks to be built in the Mississippi below the government bridge. Models were exhibited and a motion picture presented showing the operation of the gates and locks under various conditions of water flow including ordinary and maximum flood stages.

NIGHT CLASS AT ROCHESTER

W. T. Morgan Is Instructor of Classes Chapter Sponsors at Mechanics Inst.

Under the auspices of the Rochester chapter, A. S. S. T., the Mechanics Institute, Rochester, has commenced an evening course in advanced Heat Treatment and Metallography of Iron and Steel.

W. Trefor Morgan, metallurgist of the Taylor Instrument Cos., is instructor, and is assisted by Royal Weller of the Institute faculty. Mr. Morgan is a member of the Executive Committee of the Rochester Chapter.

Before assuming charge of the metallurgical staff of the Taylor Companies in 1929, Mr. Morgan was with Babcock & Wilcox Co., Bayonne, N. J., and was at that time a member of the New York Chapter.

ALLOYS DOGGEREL APPEARS

The February issue of the *Midvale Safety Bulletin*, a publication of the Midvale Co., Nicetown, Philadelphia, contained the following bit of doggerel which REVIEW readers may appreciate.

ALLOYMANIA

Take sixteen parts of plain Fe,
And add a little B and V,
A pound of Mo, an ounce of Co;
And aim to keep the sulphur low.
Mix ten per cent of clean Si
With thirty pounds of high Ni,
A dash of C, a pinch of P
What kind of metal will it be?

METALS STUDY REAL SCIENCE, V. N. KRIVOBOK TELLS BUFFALO

Eighty Attend Feb. 26 Meeting

By Charles F. Wahl

The Buffalo chapter met Feb. 26 with twenty-eight present at dinner. About eighty members and guests attended the meeting.

The speaker of the evening was V. N. Krivobok of the Carnegie Institute of Technology, Pittsburgh, who spoke on the Science of Metals. In the last ten years, metals have become a real science due to the super-machines which are in use today.

Four important phases are, inspection of engineering materials, service development, invention of new material, and true scientific work and data relating to research. Inspection of engineering materials consists of chemical analysis, physical properties, metallography, characteristic of composition and X-Ray.

Certain alloys will have a definite structure, depending on heat treatment. Metallography is one way of judging the structure and heat treatment, also failures that occur from welding and defects in steel.

Every day some engineer wants some new kind of steel, it would be better to consult a trained metallurgist because some engineers do not understand the best application of certain alloys. Pure iron is far superior to iron that contains small amounts of silicon and manganese. Science of metals has passed the stage when we depend on its findings.

NEW HAVEN VISITS MALLEABLE FOUNDRY

Inspect Plant and Then Hold Practical Question Meeting

By R. T. Porter

The New Haven chapter held a bang-up party on Feb. 26, 1931, starting with a plant visitation at the Malleable Iron Fittings Co., Branford, Conn.

One hundred members and their friends were taken to the steel castings department to watch the pouring of one of the heats from a new electric furnace.

From here we went to the malleable iron department and witnessed the pouring of a 20 ton heat. This furnace, whose heat is supplied by pulverized coal, is very unique in design.

The next department visited was where the malleabilizing of the castings was done. Most of the charges in these large furnaces weigh 40 tons and this heat also is supplied by pulverized coal, and a constant uniform temperature is maintained. These furnaces are specially insulated and the cooling is done at a very slow rate.

The machine department was the last visited, thereby enabling all visitors to trace the manufacture from the molten iron to the finished product.

The technical meeting was held in the Hammond Laboratory of Yale University. The meeting was in charge of Chairman Henry Keshian. This was an open meeting in answer to the demand by the members. They were asked to bring dies or tools which presented a problem to them in heat treatment or those which had shown unusual performance.

Many heat treating problems were brought to the attention of all and no doubt those who attended certainly profited by the experiences which were related. It has always been the policy of the New Haven chapter to lean toward the practical rather than the theoretical side and we feel very justified that this meeting in particular was a huge success.

GRAY IRON INST. EXPANDS

Establishes Technical and Research Department for Users of Castings

The Gray Iron Institute has recently established a Technical and Research Department for the purpose of advising buyers and users of castings in regard to specifications and selection of the correct grade of material for any specific purpose and to secure the very best results from gray cast iron in its many forms. Such problems as the proper mixture to use for a given condition, suggested methods for producing castings; in fact, engineering or manufacturing problems of any kind pertaining to gray iron are being handled by this department.

Members of the A. S. S. T. are urged to use this department freely, there is no obligation of any kind, for the department has been developed to assist on any problems involving gray iron castings in their product or manufacturing processes. The Institute's offices are in Cleveland.

KINZEL DISCUSSES SURFACE HARDENING

Paper at Detroit Emphasizes Nitriding and Carburizing

By O. W. McMullan

The February meeting of the Detroit chapter was held Feb. 9.

A talk on "Surface Hardening" was presented by Dr. A. B. Kinzel of the Union Carbide and Carbon Research Laboratories. Dr. Kinzel suggested that surface layer hardening would be a more appropriate term and that hardness should include a wide range from 250 to 1000 Brinell.

Different methods of producing surface hardening were mentioned. The oldest was hardening copper by burning the surface to form copper oxide. Special methods of work hardening include the cloudburst method and similar hardening while a magnetic field helps align the atoms. Another method is to heat only the surface as with an acetylene torch. Still another method is the deposition of a hard material on the surface.

Absorption of nitrogen produces nitrides which are dispersed throughout the ferrite giving precipitation hardness. Higher temperatures give austenite and increase diffusion but produce different nitrides. The original nitrides cannot again be obtained so the temperature must be kept low and diffusion is necessarily slow.

The process could be speeded up by using a gas which would penetrate before breaking up. This has not yet been accomplished. Carbon-containing gases are easy to work with but nitrogen must be active and will remain so only 70 to 130 seconds. If NH₃ carries another gas such as urea, nitroglycerine, hydrazine, etc., to give nitrogen atoms, the process is speeded up.

Another method of speeding up the process is to increase the surface concentration with salt. The salt is the 53% KCN-47% NaCN mixture with the low melting point of 430° C. permitting its use at 460-515° C. This gives a very hard case of .0005". This treatment may follow ordinary cyaniding to give a deeper case with a hard surface.

X-RAY IN WELDING, CASTING IS TOPIC

Springfield Invites Ordnance Officers to Hear Dr. Lester

By Geo. H. Glynn

The regular meeting of the Springfield chapter was held jointly with the officers of the Bridgeport District Ordnance.

Dr. H. H. Lester, research physicist at the Watertown Arsenal, was presented to the gathering by Major J. K. Clement of the Bridgeport District Ordnance Office. Major Clement outlined the aims and functions of the Ordnance Department, stating that the country is divided into twelve ordnance districts. The Ordnance Department endeavors to establish what the manufacturers in these several districts can supply in war times both in regards to munitions and supplies for the essential industries.

Dr. Lester spoke on the "X-Ray Control of Welding and Casting Technique." The microscope can be depended upon up to a magnification of 3000 but to study the arrangement of the atoms in a crystal, X-rays and the diffraction patterns obtained supply the information. The X-ray has also proved invaluable in establishing good foundry practice both in casting and welding. The certainty of securing sound castings by correct practice now enables larger guns to be cast rather than forged.

Dr. Lester also told how the X-ray has aided in securing sound welds. Periodic welded test specimens from operators for X-ray, tensile and macroscopic tests serve as a good check on their work.

At the conclusion of the meeting a discussion arose as to the danger in being exposed to X-rays. Dr. Lester said that naturally certain precautions have to be taken and if these are carefully observed the danger is reduced to a minimum. Another question arose as to whether the Gamma-ray would supplant the X-ray in usefulness because of its mobility and less exacting requirements in equipment and the fact that the Gamma-ray emanations are not harmful. Dr. Lester replied that each ray had its separate field and that while the Gamma-ray equipment may be easily moved about, the time for an exposure is much longer and the films lack the fine detail found in X-ray photography.

CHICAGO LADIES ENTERTAINED BY SPECIAL CHAPTER PROGRAM

Like Talks and Demonstrations

By Harry Hardwicke

The program for the February meeting was arranged with the idea of entertaining the ladies—wives and friends of our members.

A goodly number of the faithful had departed for the Pacific Coast to attend the Western Metal Congress and Exposition at San Francisco, but a large turn-out of the fair sex gave us our usual good attendance and a very pleasant evening.

While an excellent dinner was being served, Elmer Anderson, eminent tenor, and two lady artists from the National Broadcasting Co. rendered an interesting program.

Dr. John S. Coulter, assistant professor in charge of the physico-therapy department at Northwestern University Medical School, delivered an instructive coffee talk on "The Use and Abuse of Ultra Violet Radiation."

"Some New and Old Demonstrations in Science," was the subject of the principal speaker of the evening, Dr. Paul E. Klopsteg, president, Central Scientific Co., Chicago. His demonstrations with liquid air and high frequency current as related to broadcasting were both interesting and instructive.

AJAX METAL CO. SUBDIVIDES

Ajax-Electric Furnace Corp. Will Make and Sell Induction Type Furnaces

The Ajax Electrothermic Corp., the division of the Ajax Metal Co. of Philadelphia, which manufactures and exports the Ajax-Northrup high frequency coreless induction method of heating, has from the beginning operated as a separate company, but largely controlled by the Ajax Metal Co. The Ajax-Wyatt division, which has manufactured and exploited the Ajax-Wyatt submerged resistor induction type furnace has up to this time operated merely as a department of the metal company.

It is now intended to divorce the Ajax-Wyatt Electric Furnace division and accordingly a separate company, under the name of Ajax-Electric Furnace Corp., has been incorporated and organized for the purpose of carrying on the activities in the line of submerged resistor induction electric furnaces.

NEW FURNACE FOR NITRIDING

The American Electric Furnace Co. of Boston, Mass., announces the completion of all production and operation tests on a new electric nitriding unit which shows remarkable advance over existing methods of nitriding.

The unit has no moving parts. Nitriding is done under pressure in a gas tight container, and the results show that unusual efficiency has been attained.

CHARLES F. LEAR DIES SUDDENLY

Cleveland chapter lost a valued member when Charles F. Lear, district representative of Darwin and Milner, Inc., died suddenly on Feb. 6.

ELECTRIC FURNACE FOR SALE

American Electric Box Type Furnace Model B-9 for carburizing, hardening, tempering and annealing. Operating range up to 1900° Fahr. Size of effective hearth 24" wide x 72" long. Size over-all 6 ft. wide x 9 ft. long. The electric capacity is sufficient to heat 650 pounds per hour to 1500° F.

Cost complete with switch board and recording pyrometer \$3,100.00. This furnace is practically new and we are willing to sell it for \$2,000.00. Address

THE KROYDON CO.,
Maplewood, N. J.

SALES REPRESENTATIVE

Wanted by conservative firm manufacturing full line of carburizing and metallurgical materials. Only men who have wide acquaintance and following considered. Commissions only. Please state territory covered and record. Address 2-10.

Employment Service Bureau

Address answers care of AMERICAN SOCIETY FOR STEEL TREATING, 7016 Euclid Ave., Cleveland, unless otherwise stated.

POSITIONS WANTED

CHEMICAL ENGINEER and metallurgist, university graduate; three years' laboratory and plant experience in ferrous foundry. Location immaterial. Address 3-10.

METALLURGIST: five years' experience in chemical and physical laboratories and production heat treating. Can handle men. University graduate. Age 30. Address 3-5.

ELECTRIC WELDER: eleven years' experience, desires permanent position. Prefer to connect with reliable firm who employs one welder on maintenance or production work. Address H. B. Furman, Box 466, Matamoros, Pa.

NOTICE

Firms interested in selling their furnaces in Poland have to communicate with J. ZUBKO, ul. Zwirowa, Brwinow, Poland